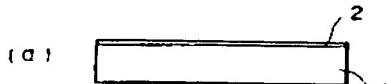


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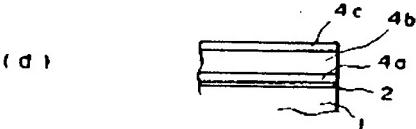
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 <NTT>;



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INT.CL. : G02B 6/12 C30B 33/00 H01L 27/14

TITLE : PREPARATION OF SILICON WAFER  
 HAVING OPTICAL WAVEGUIDE FILM



**ABSTRACT :** PURPOSE: To enable formation of an electronic element on a substrate on which an optical circuit element has been formed without being restricted in relation to the process by retarding diffusion of dopant to the silicon substrate side by providing a diffusion inhibiting layer.

CONSTITUTION: An inhibiting layer 2 for diffusion of dopant comprising SiO<sub>2</sub> film is formed by oxidizing thermally the surface of a silicon wafer 1. The silicon wafer is a P type CZ wafer having (100) face bearings and 9Ω-cm resistivity. The thermal oxidation is carried out in dry CO<sub>2</sub> atmosphere at 1,000°C and the thickness of the SiO<sub>2</sub> film is regulated to ca 1,000 Å. Succeedingly, gaseous starting material for forming glass consisting primarily of SiCl<sub>4</sub> contg. appropriate amt. of GeCl<sub>4</sub>, BCl<sub>3</sub>, PCl<sub>3</sub> as dopant is converted to fine glass particles by the flame hydrolysis of the gaseous starting material to deposit film 3 of fine glass particles having ca. 700μm thickness, which is heated in an electric furnace (in oxidizing atmosphere) to 1,150°C and held for 2hr to vitrify the fine glass particle film 3 to transparent glass. Thus, optical waveguide film 4 is obtd. on the silicon wafer 1.

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